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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,054	06/20/2001	Fumio Miyajima	Q65060	2708
7590 01/02/2004				
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037			EXAMINER ORTIZ, ANGELA Y	
			ART UNIT 1732	PAPER NUMBER

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/884,054	MIYAJIMA, FUMIO	
	Examiner	Art Unit	
	Angela Ortiz	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 7-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-6 in response with mail date of 21 October 2003 is acknowledged.

Claims 7-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in response mailed 21 October 2003.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyagawa et al., USP 6,261,501.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The cited reference teaches the claimed method of sealing a semiconductor chip flip-chip bonded to a substrate comprising the steps of providing a release film over a cavity and resin supply area, placing the chip bonded substrate within the mold cavity, supplying resin to underfill the chip and separating a gate runner connected to the end of the substrate. A cavity insert is further provided, and acts in cooperation with side blocks 100 which are readable on the claimed movable block, and moves the release film to cover both sides of the chip prior to sealing the side surfaces. Note that the side blocks can be retracted or movable. When the component is underfilled, the blocks are removed, and the side surfaces are encapsulated. Note that the resin at the end of the substrate is thinner than the molding formed, because the cavity size is lower or thinner than the cavity for molding the underfilled portion; see the inner flow paths that lead out from gate 70 in figures 1, 2, and 6. See col. 11, line 1 to col. 12, line 10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being obvious over Miyagawa et al., USP 6,261,501 in view of Shinma, USP 6,563,207.

The applied primary reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned

by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

The cited primary reference teaches the basic claimed process of sealing a semiconductor chip flip-chip bonded to a substrate comprising the steps of providing a release film over a cavity and resin supply area, placing the chip bonded substrate within the mold cavity, supplying resin to underfill the chip and separating a gate runner connected to the end of the substrate. A cavity insert is further provided, and acts in cooperation with side blocks 100 which are readable on the claimed movable block, and moves the release film to cover both sides of the chip prior to sealing the side surfaces. Note that the side blocks can be retracted or movable. When the component is underfilled, the blocks are removed and the side surfaces are encapsulated. Note that the resin at the end of the substrate is thinner than the molding formed, because the cavity size is lower or thinner than the cavity for molding the underfilled portion, see the inner flow paths that lead out from gate 70 in figures 1, 2, and 6. See col. 11, line 1 to col. 12, line 10.

The cited primary reference does not teach the claimed feature of pushing the sealing back to the resin pot, or a v-shaped groove, or a sprue formed thicker at the substrate end than at the pot-side.

The added secondary reference demonstrates as conventional the feature of providing a mold having movable inner and outer portions, readable on pins or clamps, of a molding die that move independently. Note that portions are tapered at the substrate end with a v-shaped groove-like formation. Note further that the excess resin

flows outward from the center to the substrate end, and is shaped at the substrate end with a thicker sprue that where the encapsulating resin is supplied. With respect to the feature of pushing the sealing resin, note that the added reference teaches that a male mold center portion moves down, then a female mold center portion moves up, then inner and outer pins move down sequentially, forcing the resin outward, then female die 143 moves up which cuts off sprue material using the taper portion, then die 140 is moved up further. See col. 7, line 1 to col. 8, line 55.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a v-shaped groove, or a sprue formed thicker at the substrate end than at the pot-side in view of the added reference, when performing the process set forth in the primary reference, as the groove can be used to remove undesired sprue, and the resin flows from the center out in the described embodiment, thus the sprue will be at the substrate end and will be thicker than the center portion.

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to push the resin back to the pot in view of the added reference, when performing the process set forth in the primary reference, as the inner and outer movable mold portions operate independently, and to move the portions from right to left or left to right is well within the choice of the skilled artisan / practitioner, depending on the desired flow of resin.

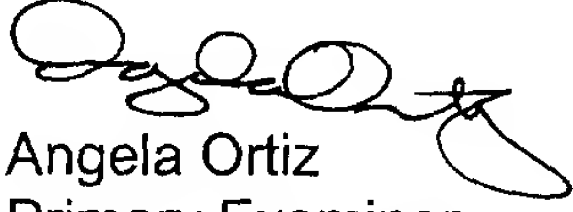
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP's 5824252; 5891384; 6000924; 6048483; 6352423; 6459159.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela Ortiz whose telephone number is 703-308-4446. The examiner can normally be reached on Monday-Thursday 9:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 703-305-5493. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Angela Ortiz
Primary Examiner
Art Unit 1732

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